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DEC 27 2007**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Currently Amended) A method of providing communication support for collaborative applications comprising:

abstracting a network and application server resources at a middleware level;

and

~~supporting the middleware level by indexing the application server~~ resources in a network aware and application aware manner to reflect positions of the application server resources in an application space;

indexing a plurality of users to reflect communication interests of the plurality of users in the application space; and

forming a communication overlay tree that provides communication links between the application server resources and the plurality of users, via the middleware level.

2. – 3. (Cancelled)

4. (Currently Amended) A communication network, comprising:

a plurality of network resources having network constraints, the plurality of network resources including a plurality of application servers controlled by an application having an application space; and

a middleware server connected to said plurality of network resources, including the plurality of application servers, said middleware server for establishing an attribute space based on attribute information that includes said network constraints and on said application servers, the middleware server for indexing the plurality of application servers to reflect their positions in said attribute space, the middleware server further for

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implementing a communication overlay tree that provides communication links between the plurality of application servers and the middleware server based on network constraints and on the application space.

5. (Original) The communication network of claim 4, further including a plurality of users, each having a communication interest in said application space, and where the middleware server indexes the plurality of users according to communication interest to form user index identifiers; and where the communication overlay tree is implemented based on the plurality of users and on their communication interests.

6. (Currently Amended) The communication network of claim 4 where the middleware server indexes network addresses of said plurality of users.

7. (Currently Amended) The communication network of claim 5 where the middleware server provides said application with user index identifiers via an application server.

8. (Currently Amended) The communication of claim 7 where the application server sends said middleware server a list of users and data that is to be distributed to users on said list of users, such that said middleware server identifies network locations of said users on said list of ~~uses~~ users, and such that said middleware server sends data that is to be distributed to the network addresses of users on said list of users.

9. (Currently Amended) The communication network of claim 8 wherein said application uses said user index identifiers to produce lists of users to be notified upon an occurrence of a notification event in said application space, and such that said list of users is sent upon an occurrence of a notification event.

10. (Currently Amended) The communication network of claim ~~[[7]]~~ 8 wherein said application server sends said list of users and said data that is to be distributed to users

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on said list of users using application program interfaces.

11. (Currently Amended) The communication network of claim 4 wherein a change in a network constraint induces said middleware server to implement a new communication overlay tree.

12. (Currently Amended) A method of virtualizing network resources to support collaborative communications in a network having application servers and users that have communication interests, the method comprising the steps of:

constructing a scalable network map;

indexing application servers according to their position in the network;

indexing users according to their communication interest;

generating a communication overlay tree based on the indexing of the applications application servers, on the indexing of the users, and on the scalable network map; and

supporting communications between application servers and users over the communication overlay tree.

13. (Currently Amended) The method of claim 12 wherein the scalable network map is further based on supporting service level agreements.

14. (Original) The method of claim 12 wherein supporting communications includes operating according to middleware software.

15. (Original) The method of claim 12 wherein generating a communication overlay tree is repeated upon changes to the network.

16. (Original) The method of claim 12 wherein indexing users includes indexing a new user to the network.

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17. (Original) The method of claim 12 wherein an application server is indexed if it enters the network.

18. (Currently Amended) A method of operating a communication network, comprising the steps of:

identifying a plurality of network resources and their network constraints;

identifying a plurality of application servers that are controlled by an application having an application space;

identifying a plurality of users and a communication interest in the application space of each user; and

indexing the plurality of application servers to reflect their position in an attribute space;

indexing said plurality of users according to communication interests;

forming a user index identifier for each user of said plurality of users; and

establishing a communication overlay tree between the plurality of application servers and the plurality of users based on the identified network constraints and on the indexed plurality of users, the communication overlay tree providing communication links between the plurality of application servers and the plurality of users.

19. (Original) The method of claim 18, further including indexing network locations of each user of said plurality of users.

20. (Original) The method of claim 19, further including providing the application with the user index identifier for each user via an application server.

21. (Original) The method of claim 20, further including sending data from an application server to at least one user of said plurality of users based on the communication interest of the at least one user and on the user index identifier of the at least one user.

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22. (Currently Amended) The method of claim 18 wherein indexing of the plurality of users includes indexing new users to the communication network.

23. (Original) The method of claim 18 wherein establishing the communication overlay tree is at least partially based on round trip travel times.